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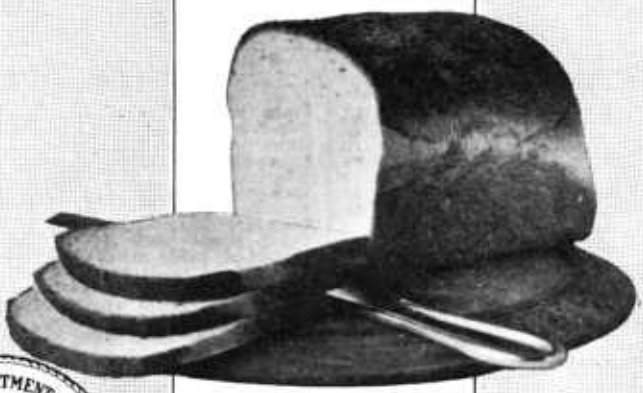
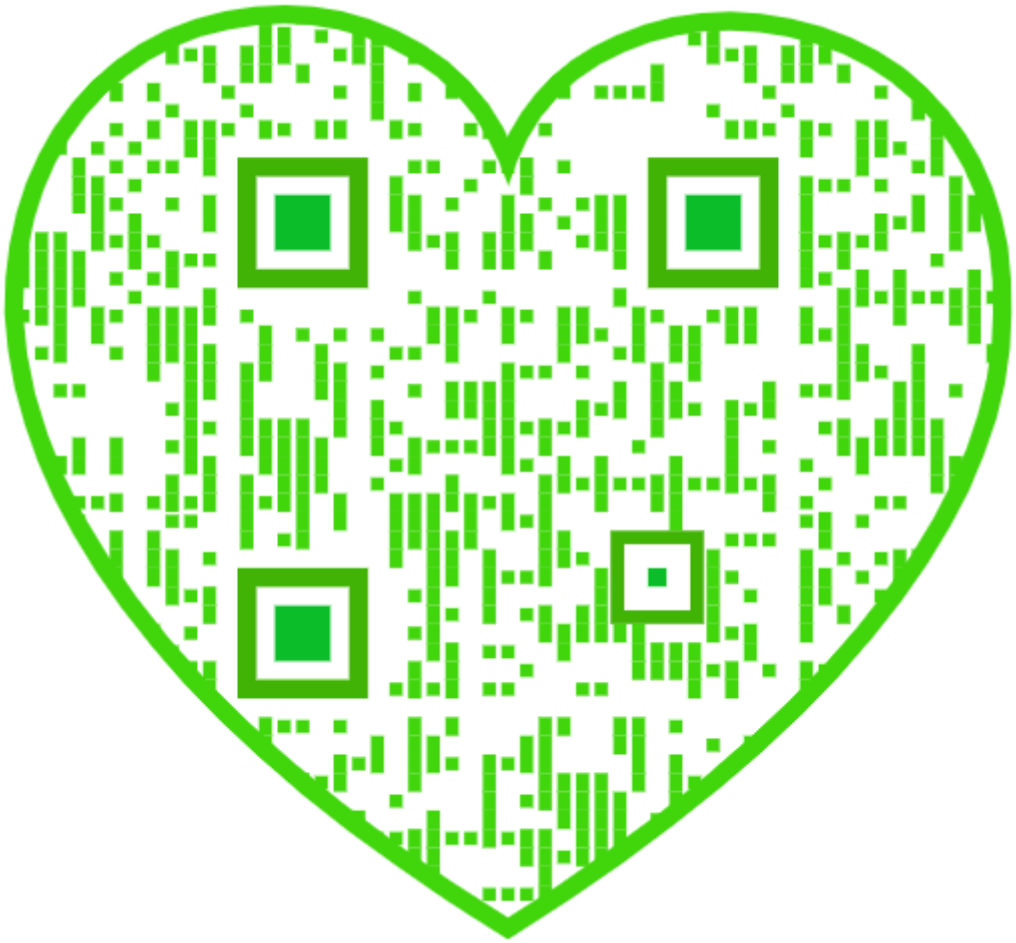
HOME BAKING



UNITED STATES DEPARTMENT OF AGRICULTURE



SOME KIND OF BREAD is served on the average American table three times a day. The quality of that bread is an important matter. The food value depends on the materials which go into it, whether it is made at home or in the bakery. This bulletin has been planned primarily as a guide in home baking, but through its discussion of materials it offers help also in the choice of commercial baked products.

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HOME BAKING

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Good bread for her family is one of the important concerns of the homemaker. This bulletin points out what makes for high quality and gives methods and proportions for making typical yeast breads, quick breads, cakes, and other baked goods at home. These main types may be varied in almost innumerable ways by the housekeeper by adding seasonings or by baking in different shapes and sizes. A great variety of recipes is not included; instead emphasis is placed on the general principles of baking, proportions, and ways of substituting various ingredients, such as soft-wheat for hard-wheat flour, so that the housekeeper can make economical use of the materials at hand.

FLOUR AND OTHER MILL PRODUCTS OF WHEAT

For making most kinds of bread and similar products wheat flour is superior to all others because of the two proteins in it which form gluten when the flour is made into a dough. This gluten is what gives the dough an elastic quality, so that it can expand and hold within it gas bubbles formed by yeast or other leavening agents. It is known to the farm boy as "wheat gum," which he makes by chewing the wheat kernels, and may be easily recognized as the grayish yellow substance left when the starch is washed out of wheat flour.

The bread-making value of different types of wheat flour depends on the quantity and the quality of the gluten that can be developed in them. For practical purposes these gluten-forming proteins in the wheat grain and flour are referred to as gluten, as though they were combined. Flours are called "strong" if they have a comparatively large quantity and good quality of gluten, and "weak" if their gluten is low in quantity or poor in baking quality.

The nature and the amount of gluten in flour depends both on the kind of wheat from which it is made and on the milling. The wheats which make the strongest flours are grown mostly in the regions between the Rocky Mountains and the Mississippi Valley, north and west of Missouri. The wheats grown in the more humid areas between the Great Plains area and the Atlantic coast and most of the wheats of the Pacific coast are softer and less glutinous.

Out of any lot of wheat, either hard or soft, it is possible to mill several kinds of flour that differ considerably in their bread-making quality and in their food value. The present milling process is very complicated and highly specialized. The grain is broken up gradually by passing it between several pairs of rolls, and after each step in its reduction some separation of the material is made according to the size and character of the particles. In this process the bran and germ are usually removed, and the material milled from the remaining grain is combined or separated to form different commercial grades of flour. The two grades most commonly sold to the housewife are "straight" and "patent."

"Straight" or "straight run" flour usually contains about all of the grain except the bran, the shorts, and the germ, and is approximately 70 per cent of the total weight of wheat milled.

"Patent" flours are classed as "long patents" or "short patents," depending on what proportion they represent of the total flour milled from the grain. Certain streams which are utilized in the production of so-called clear flours are excluded from the patent flours, but are included in the "straight." A short patent may contain less than 50 per cent of all the flour milled from the grain, and is seldom made except for commercial bakers, who want a flour of maximum bread-making power. A longer patent, which contains perhaps 60 or 65 per cent of the total flour, is more common.

In the manufacture of either "patent" or "straight" flour the bran, the shorts, and the germ of the wheat are removed. This, of course, sacrifices

some food value, for most of the minerals and vitamins of wheat are contained in these portions. This loss may be compensated for, however, by the improvement in the baking strength of the flour.

Graham flour,[1] or wheat meal, as it is more properly called, contains all of the wheat and has some advantages from the point of view of food value over a flour that does not contain the bran and the germ. It does not, however, keep so well as white flour. In a diet that is limited in variety, and hence likely to be lacking in certain elements, some of the breads should be made from this kind of flour. In a diet containing plenty of milk, eggs, fruits, and vegetables the bran and the germ of the wheat kernel are not so essential, but even in this case breads made from graham flour add flavor and variety.

Bran, the dark, fibrous portion of the wheat, is less completely digested than the rest of the kernel. As bran is sold commercially it has some food value from the starch as well as from the minerals and vitamins associated with the fibrous parts, but it is used chiefly for its laxative properties. In moderate quantities, and especially as it comes ground up in graham flour, it is usually considered to be a desirable addition to the diet.

SPECIAL USES FOR STRONG AND WEAK FLOURS

Strong flours made from hard wheats are generally considered best for yeast bread, although with proper methods excellent results can be obtained with those from some soft wheats. For cake and pastry, in which tenderness is of prime importance, soft-wheat flours are usually the more successful. Quick breads, such as muffins or biscuits, may be made about equally well with either type.

It is difficult for a housekeeper to tell what type of flour she is buying, especially as those on the market vary all the way from very strong to very weak. The flours from soft wheats have a velvety texture somewhat like cornstarch, and those from hard wheat are usually more gritty, but it requires some experience and a fine sense of touch to detect this difference. Experts usually do it by taking a pinch of flour and rubbing it lightly between the thumb and the third finger. Another way to tell is by squeezing a handful of it tightly and noticing whether as the hand is opened the flour remains in a mold and shows the impression of the fingers. In this test a hard-wheat flour acts more like a powder and the mold breaks up more readily than that of a soft-wheat flour. Weighing is still another method used to distinguish hard-wheat flours from soft. A quart of hard-wheat flour that has been sifted once, dipped lightly into the measure, and then leveled off, weighs about 16 or 17 ounces or even more. A quart of soft-wheat flour sifted and measured in the same way weighs only about 14 or 15 ounces.

It is much easier to get good results in baking if the methods used are adapted to the type of flour. When occasion demands, good yeast bread can be made from a comparatively weak flour or good cake from a strong one, by making sufficient allowance for the weakness in the former case and for the strength in the latter. The rules for substituting (pp. 6 and 9) apply to typical hard-wheat and typical soft-wheat flours.

COMPOSITION OF WHEAT FLOUR

The approximate chemical composition of different types of hard-wheat and soft-wheat flours is shown in Table 1. Though no indication of vitamin content can be given in such a table, experiments have shown that in general the highly refined flours contain practically none of the vitamins present in the whole-grain products.

TABLE 1.—*Approximate composition of different types of wheat and wheat flour*

	Carbohydrates (mostly starch)	Fat	Protein	Water	Mineral matter (ash)		Carbohydrates (mostly starch)	Fat	Protein	Water	Mineral matter (ash)
Hard wheat:	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	Soft wheat:	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
Grain	70.9	1.8	12.3	13.2	1.8	Grain	72.2	1.9	11.0	13.2	1.7
Graham flour (wheat meal)	70.9	1.8	12.3	13.2	1.8	Graham flour (wheat meal)	72.2	1.9	11.0	13.2	1.7
Straight flour	73.7	1.1	11.5	13.2	.5	Straight flour	75.8	1.2	9.4	13.2	.4
Patent flour	74.6	1.0	10.8	13.2	.4	Patent flour	76.7	1.1	8.7	13.2	.3

[1] The terms "whole wheat flour" and "entire wheat flour" may mean the same as graham flour, but at present these names are sometimes commercially used for products that do not contain all of the bran.

OTHER FLOURS AND MEALS USED IN BAKING

Rye ranks next to wheat as a bread grain because it contains similar proteins. In fact, rye flour is practically the only other kind that can be used successfully alone in yeast breads, and even it gives better results if mixed with wheat flour. Products from corn, oats, buckwheat, barley, rice, potatoes, peanuts, soy beans, and many other materials may be substituted for part of the wheat flour in yeast breads, and some of them can be used as the chief ingredient of excellent quick breads, where there is less need for gluten.[2] This is especially true when egg is used. Usually, however, even in quick breads, a mixture of wheat flour with the other material makes a lighter product.

MEASUREMENTS

3 teaspoons =1 tablespoon
16 tablespoons =1 cup (standard)
4 cups =1 quart

All quantities are given in level measurements.

Flour, except graham or whole wheat, should always be sifted once before measuring and then dipped lightly into the measure and leveled. If it is packed into the measure, too much will be used.

In measuring less than one-fourth of a cup of hard fat it is best to use tablespoons (one-fourth cup=4 tablespoons). When the quantity is between one-fourth cup and 1 cup, time is saved by measuring it in water. For example, if two-thirds cup of fat is required, put one-third cup of water into the cup first, and then add fat until the water comes up to the brim.

A table knife or other straight edge should be used to level sugar, salt, flour, and other dry ingredients.

YEAST BREADS

The points that are most important in yeast breads in addition to food value are lightness, good flavor and color, texture, and keeping qualities. The accompanying score card may be helpful as a means of showing how bread can be judged.

Score card for yeast breads

	Points
General appearance	10
Shape—roundness of "dome."	
Smoothness—no cracks, bulges, lumps, or the like.	
Color of crust—golden brown.	
Lightness	10
Crust	10
Thickness.	
Quality—crispness and tenderness.	
Crumb:	
Color—light cream color	5
Texture	25
No streaks or extreme closeness of grain.	
Size and uniformity of cells, thinness of cell walls.	
Elasticity—softness and springiness.	
Flavor—taste and odor	30
Sweet, nutty flavor with no "off" taste.	
Keeping qualities	10
	100

INGREDIENTS OF YEAST BREADS

The essential ingredients in bread are flour, liquid, salt, and leavening. French bread illustrates that an appetizing product can be made from these materials with water as the liquid. In this country, however, it is customary to use sugar, shortening, and oftentimes milk.

Flours have already been discussed.

Liquid.—When milk is used as the liquid the bread is improved in food value and does not grow stale so rapidly as when water is used. From the nutritive standpoint, for instance, wheat is poor and milk is particularly rich in calcium, one of the important mineral constituents in which the diet is often low. Evaporated or powdered milk may be used when fresh milk is difficult to obtain. Bread made with potato water does not dry out so fast as that in which water is used as the only liquid.

Shortening.—The fat in bread makes it more tender and adds to its fuel value. Butter is sometimes used, chiefly for its flavor, but lard or any other good cooking fat is satisfactory.

Sugar.—A small quantity of sugar added to the dough makes it rise more quickly and helps to give a golden brown color to the crust. Some persons think that the flavor also is better when sugar is used.

Salt.—Salt is added for flavor. The yeast grows faster in bread dough when only a small quantity of salt is used, but there should be enough of it to bring out the wheat flavor.

Yeast.—Yeast, the minute cell-like plants put into bread dough to leaven it, may be bought in dry or compressed cakes or grown at home in the form of a "starter," or "liquid yeast." The dry cakes keep better than the other forms; but since the yeast cells are not growing actively, longer time

[2] Suggestions for using corn and rice products in baking are given in U. S. Dept. Agr. Farmers' Bul. 1236, Corn and Its Uses as Food, and Farmers' Bul. 1195, Rice as Food.

is required to make bread with dried yeast. The compressed is perhaps the most convenient to use if it can be obtained fresh. It is usually more expensive than the other forms, however, and it spoils rather easily. Many housekeepers also get excellent results with so-called liquid yeast and consider it a convenience and economy. Mixtures of this kind are discussed more fully in connection with the use of soft-wheat flours. In any case the yeast for bread making should be pure and in good condition.

FERMENTATION

As yeast causes bread dough to ferment, tiny bubbles of carbon-dioxide gas, which leaven the dough, and by-products, which change the character of the gluten, are formed. The latter fact is one of the reasons why dough made with soft-wheat flour must be handled somewhat differently than that in which hard-wheat flour is used.

Like all living things, yeast needs a favorable temperature as well as moisture and right food in order to grow vigorously. The best temperature for bread fermentation is probably between 80° and 85° F. Yeast grows faster at temperatures even slightly above 85° F., but when the dough gets warmer than this the conditions become more favorable to the growth of other less desirable organisms that may be present. If the temperature of the dough goes much over 95° F., the growth of the yeast is in danger of being retarded.

In order to keep the dough at a constant temperature of about 82° F. the bread bowl or pan may be covered and set in a vessel of water. Ordinarily, when the temperature of the room is much lower than 80° F., the water in the outer pan should be about 90° or 95° F. In hot weather, when the air is warmer than 85° F., the water should be slightly under that temperature. When a sponge or starter (p. 6) is allowed to stand overnight, it should be well protected against drafts and placed where it will be neither chilled nor overheated.

Since temperature is so important in bread making, the use of a thermometer is helpful. Experienced bread makers can often tell by the feeling when the temperature is right, but this method is not thoroughly dependable. A dairy thermometer is usually easy to obtain and not very expensive.

The rising of the dough should be stopped at the right point. If it is allowed to stand too long before it is "punched down," an unpleasant or sour flavor may develop and the gluten will be injured. If the dough rises too high in the pan before it is put in the oven, it will be too coarse-grained; and if it does not rise high enough, the bread will be heavy.

The proper length of time for dough to rise depends on the vitality of the yeast, the temperature at which the dough is held, and the strength of the gluten. Volume, appearance, and feeling all indicate when dough has risen long enough. The best test is made by touching the surface of the dough lightly with the finger. If it has risen enough, a slight depression will remain on the surface. If the dough is still so elastic that the depression disappears quickly, it should rise a little longer. Dough made with very strong flour will reach about two and one-half times its original volume before this test is obtained, but dough made with rather weak flour will give the same test when about double its original volume.

PROPORTIONS AND METHODS

The following proportions will make about 3½ pounds of bread. A larger quantity of flour is required when soft-wheat flours are used (p. 6). The liquid may be milk, water, potato water, or any combination of these. All measurements are level:

About 2¼ pounds, or 2¼ quarts, sifted hard-wheat flour.
2¾ cups liquid.
4 teaspoons salt.
2 tablespoons sugar.
2 tablespoons fat.
1 ounce (2 cakes) yeast.

From these ingredients bread may be made by various methods. The common standard ways, known as the straight-dough and the sponge methods, are described here and suggestions given for varying them.

STRAIGHT-DOUGH METHOD USING COMPRESSED YEAST

With the ingredients in these proportions and with the temperature about 82° F. bread can be made by the straight-dough method in about four hours from the time the dough is mixed until the loaves are put into the oven. If the time must be shortened, twice or even three times as much yeast may be used and the sugar increased in about the same proportion. The dough must then, of course, be watched very closely, as there is more danger of letting the fermentation go too far.

Mixing.—A small quantity of the liquid, about one-half cup, must be set aside for softening the yeast. If milk is used, it must be scalded first

to check the growth of bacteria, and then cooled. In this case the part reserved for soaking the yeast should be cooled quickly, and the rest may be poured while still hot over the sugar, salt, and fat.

Other liquids than milk usually do not require heating, but often this is done for convenience in dissolving and melting the sugar, salt, and fat. In any case the liquid mixture should be brought to a temperature below 100° F. before mixing with the yeast. This exact temperature depends on that of the room and of the flour, and should be so adjusted to these as to bring the temperature of the dough to about 82° F.

The flour, except about 1 cup, should be added to the liquid and mixed thoroughly with a spoon, the hands, or a mechanical bread mixer. All the flour may be added at once if experience has shown the amount necessary. It is impossible, however, to tell beforehand exactly how much flour will be required unless flour from this lot has been used. The experienced bread maker tells by the "feel" of the dough when enough flour has been added. The quantity given in the above proportions is about right for rather strong flour. If the flour is extremely strong, 2¼ pounds will be too much, but if it is of only average strength more will be needed. Usually, with a strong flour, the dough should be about as soft as it can be conveniently handled, but it should not be sticky. The quantity of flour varies also with the kind of liquid used. More flour is required with water than with milk.

With a new lot of flour it is a good plan to measure the quantity used and note the way it works. If results are satisfactory, the same methods and measurements may be repeated as long as that flour lasts.

Kneading.—When the flour and liquid are thoroughly mixed and the dough no longer sticks to the sides of the mixing bowl, it is ready to be kneaded. If a bread mixer is used, it kneads as well as mixes. If the bread is to be kneaded by hand, it should be turned out on a clean floured board and worked quickly with the palms of the hands until it is smooth and elastic. Dough made from hard-wheat flour requires more kneading than that made from soft-wheat flour.

First rising.—The dough should then be formed into a ball and put in a greased bowl to rise. The easiest way to keep the surface from drying and cracking is to turn the dough over once or twice in the bowl so that the whole surface of the dough is thinly greased. Fat should be used sparingly, however, so that no streaks of it will show later in the bread. A clean cloth over the bowl and a plate or other tight cover will help to control the temperature, to keep out the dust, and to prevent drying. The bowl may be placed in a pan of warm water to raise the temperature of the dough, if it has cooled off, and keep it between 80° and 85° F. When the dough has risen to about double its original bulk, it should be tested with the finger to determine whether it is ready (p. 4) to punch down for a second rising.

Punching down.—When the dough is light enough, the center should be punched in, the sides pulled over and pressed into the center, and the ball of dough turned with the smooth side up. This can be done in less than a minute and is preferable to taking the dough out on the board. The purpose of punching down is to let out some of the gas so that fermentation can continue without injuring the gluten by causing it to stretch too far.

Second rising.—The second rising will not take so long as the first if the temperature is right. It may be omitted if necessary, but it helps to give a good texture and fine, even grain, especially if hard-wheat flour is used. When the dough has again risen to the same stage as before, it is ready to be punched down and divided.

Dividing.—The dough should be so divided that each baking pan will be about half full at first. After dividing, the dough should be rounded into balls to seal over the cut surfaces and allowed to stand a few minutes before molding.

Molding.—The loaves are molded by flattening each of them on the board into an oblong piece and then folding and sealing the edges together with the palms of the hands. This is repeated several times, each time folding a different way. The last time the sides are brought together into the center and the loaf is placed, sealed edges down, in a greased pan for the last rising. The top surface should be lightly greased.

Rising in the pans.—The temperature, from 80° to 85° F., should be just as carefully regulated during the last rising as for the two earlier periods. The pans may be set in warm water and covered with a clean cloth. When the loaves have about doubled in bulk the surface should be lightly pressed with the finger to test whether they are ready to be baken (p. 4).

Baking.—The oven should be fairly hot at first, about 400° to 415° F., de-

pending on the size of the loaf. A pound loaf should be baked at a higher temperature and more quickly than a pound-and-a-half loaf. Unless the oven bakes very evenly, the loaves should be turned around after they have been in about 20 minutes. The temperature of the oven may then be lowered a little. If a coal or wood range is used, the temperature at the start should be 400° F. or lower.

Baking will require from 45 minutes to 1 hour, depending upon the temperature of the oven and the size of the loaf. When the loaves shrink from the sides of the pan and give a hollow sound when tapped the bread is done. Brushing the loaves with milk or butter just before they are taken from the oven oftentimes improves the color of the crusts and makes them glossy and more tender but less crisp. As soon as the loaves are taken from the oven they should be turned out of the pans and placed on a rack to cool. They should not be covered while they are warm.

SPONGE METHOD USING DRIED YEAST CAKES

With dried yeast, which takes longer to become active than compressed yeast, it is generally more satisfactory to make a sponge early in the morning or the night before the bread is to be baked. With the following exceptions, the dough is mixed and handled in the same way as in the straight-dough method using compressed yeast:

The dried yeast cake should be broken up and soaked in lukewarm water until it is soft, or for about one-half hour before mixing.

If the sponge is to stand overnight, only about half as much yeast as called for in the proportions on page 4 is needed.

The liquid, the yeast, and half of the flour should be mixed and left until they form a light and frothy sponge. For a quick sponge the sugar also may be mixed with these other ingredients.

When the sponge is to rise overnight, ordinary room temperature (65° to 75° F.) is warm enough; but for a shorter sponge process the temperature ought to be the same as for dough (80° to 85° F.). When the sponge is light it should be stirred up well. The salt, sugar, melted fat, and the rest of the flour are then added to make a dough.

After the dough is mixed it is handled in the same way as in the straight-dough method.

BREAD FROM SOFT-WHEAT FLOURS

Soft-wheat flours, because of the smaller quantity or poorer quality of the gluten, require less moisture than hard-wheat flours to make a dough of the right consistency. Therefore proportionately less liquid or more flour is used, since the dough is made a little stiffer. It will not "tighten up" during the first rising as does hard-wheat flour dough. Instead it may become softer or "slacken" a little. The proportions for bread made with hard-wheat flour (p. 4) are based on 2¾ cups of liquid and 2¼ pounds, or 2¼ quarts, of flour. For the same quantity of liquid about 2½ pounds, or 2¾ quarts, of sifted soft-wheat flour will be required.

Doughs made from soft-wheat flours rise more quickly than those made from harder ones, partly perhaps because, having less elasticity, they do not offer so much resistance to the gas bubbles formed by the yeast.

The quality of bread made from soft-wheat flour seems to be improved by using a comparatively large proportion of yeast and sugar to hasten the fermentation. If this dough is fermented for too long a period, the gluten is weakened. The proportions that seem to give the best results with soft-wheat flour are one yeast cake (one-half ounce) and one tablespoon of sugar for every pound loaf of bread. This is about double the quantity of each given in the standard proportions for bread made with hard-wheat flour (p. 4).

Soft-wheat flour doughs will not stand so much handling as those made with hard-wheat flour. If they are kneaded too hard or too long, the gluten will be injured.

Dough made from weak flour will not rise so high usually as one made from flour that has strong gluten. The fermentation of any dough should be checked before the gluten has reached the limit of its stretching power. Soft-wheat flour doughs usually reach this limit when they have about doubled their original bulk. To be safe, with a rather weak flour, the dough should be watched closely and tested with the finger before it has quite doubled in volume (p. 4).

HOME-GROWN OR SO-CALLED LIQUID YEASTS

One way to avoid the expense of using large quantities of compressed yeast, especially with soft-wheat flours, is to keep some kind of "starter" from one baking to the

next. Such a mixture is called "sponge," "ferment," "starter," or "liquid yeast," and is usually made from yeast, sugar, salt, water, and either potato or flour or both.

The following method of making liquid yeast with potato has proved particularly successful with soft-wheat flours:

3 potatoes (¾ pound).
1¼ cups boiling water.
1⅛ cups[3] "starter" or 1 cake yeast (½ ounce) in 1⅛ cups water.
About 1½ cups cold water.
3¾ tablespoons sugar.
1½ tablespoons salt.

Good, sound, clean potatoes must be used. Pare the potatoes, cut into small pieces, and cook until tender in the boiling water. Mash them in the water in which they were cooked. Add the sugar, salt, and enough cold water to make 3¼ cups of liquid, and allow this mixture to become lukewarm (about 82° F.). Add 1⅛ cups of the starter reserved from the last baking. If none of this starter is available, one cake of dried or compressed yeast soaked in 1⅛ cups of lukewarm water may be used instead. Allow this mixture to stand overnight. In the morning it should be light and frothy. Stir it well and pour off 1⅛ cups to save as a starter for the next baking, and store this in a clean, scalded jar, loosely covered, in a cool place. In very cold weather it must be protected from freezing. The remainder is ready to use. The following directions for making bread from the liquid yeast are based on the use of soft-wheat flour:

About 2¾ pounds, or 3 quarts, sifted soft-wheat flour.
5 tablespoons sugar.
3 tablespoons fat.
3¼ cups liquid yeast.

Set the yeast for about half an hour in a pan of water of the right temperature to bring it to about 82° F. Add the fat and sugar and gradually stir in the flour. The exact quantity of flour required for a given quantity of liquid differs, of course, according to the strength of the flour. The dough should be rather stiff, and should be handled according to the general directions for soft-wheat flour yeast bread.

If bread is baked twice a week or oftener and the starter is cared for properly, there should be no trouble with spoilage. If bread is not baked this often, the starter should be renewed by making up a new mixture, as described, at least once a week; or, if the weather is hot and no cool storage place is available, as often as twice a week. If the mixture should by any chance develop any unusual appearance or odor, it should be discarded and new starter made with clean materials and scalded utensils.

ROLLS

Yeast rolls are made by the same general method as loaf bread. They usually contain more sugar and shortening and sometimes egg, and milk is almost always used as the liquid. If sugar and shortening are increased, they tend to retard the growth of the yeast and the rolls take longer to rise. If desired, rolls may be made from bread dough by adding the extra sugar and shortening when the dough is ready to be punched down the first time. In this case, of course, more kneading is required in order to combine the materials thoroughly and it may be necessary to knead in more flour.

After rolls are molded and placed in the pan, they may be put in a refrigerator or other cold place to slow down the action of the yeast, and baked later. If the temperature has been so low that the rising is very much checked, they should be kept in a warm place for a little while before baking so that the volume will be about doubled.

PARKER HOUSE ROLLS (16 ROLLS)

1 cup milk.
1 cake (½ ounce) yeast.
1½ tablespoons butter or other fat.
1½ teaspoons salt.
1 tablespoon sugar.
About 3¼ cups sifted hard-wheat flour, or 4 cups sifted soft-wheat flour.

The straight-dough method is perhaps the most convenient when only rolls are made. Allow the dough to rise the first time in the same way as for loaf bread. The dough may be permitted to rise again before it is shaped into biscuits, or the second rising of the dough may be omitted. Roll the dough out thin and cut with a biscuit cutter, or cut off small pieces from the dough, roll them into balls, and flatten with the palms of the hands. Brush the top part lightly with butter, crease through the center with the handle of a table knife, fold over, and press down the top. Brush the top with butter if a soft crust is preferred. When they have again doubled in bulk bake them quickly in a hot oven (425° F.) for 10 or 15 minutes.

[3] ⅛ cup=2 tablespoons.

GRAHAM BREAD

Graham and so-called whole-wheat flours do not have so much baking strength as patent flour, and for that reason must be handled somewhat differently. The dough ferments more quickly and does not expand to so great a volume. Graham flour from hard wheat will make good bread without the addition of any white flour, but such flour from soft wheat, unless the bread is made with great skill, requires some patent or "straight" flour with it to make the bread light.

In the proportions given on page 4 graham may be substituted for all or part of the white flour. The dough should be slightly stiffer than that made with white flour, and it should not be allowed to rise so long. Also, graham bread should be baked more slowly than white bread.

RYE BREAD

Bread made entirely with rye flour or meal is heavy in comparison with wheat bread. In this country rye bread made with part wheat flour is preferred because it is lighter.

RYE AND WHEAT BREAD (2 LOAVES)

2 cups liquid.
½ cake yeast.
1 tablespoon sugar.
2 tablespoons fat.
1½ teaspoons salt.
About 3 cups sifted rye flour.
3 cups sifted wheat flour.

Make a sponge with the wheat flour as described on page 6. When the sponge is sufficiently light add the rye flour and the rest of the ingredients. The dough should be about as stiff as for wheat bread. When the dough reaches about one and three-fourths its original bulk mold it into long loaves with pointed ends.

In order to make the crust crisp, bake in shallow pans with a thin layer of corn meal on the bottom instead of grease to prevent sticking. The temperature of the oven should be about 380° F.

QUICK BREADS, CAKES, COOKIES, AND PASTRY

PROPORTIONS AND INGREDIENTS

The fundamental proportions of some of the chief types of baked products are given in Table 2. These may, of course, be varied somewhat to meet individual tastes, but in general the relations indicated should be kept between the various ingredients. One cup of liquid is the basis used in most cases and from this quantities may be increased or decreased as desired.

A recipe for almost any kind of batter or dough mixture can be made by varying these proportions. Quick loaf breads may be made from the proportions for muffins by adding more flour and leavening; almost any kind of butter cake by varying the fat, sugar, egg, or flavoring; and meat-pie crust, shortcake, or fruit dumplings by slightly changing the proportions for biscuit.

The important differences in flours, liquids, leavening agents, and the other ingredients are pointed out so that the housekeeper will know when and how she can safely substitute with the supplies at hand.

TABLE 2.—*Proportions for quick breads, cakes, cookies, and pastry*

	Liquid (usually milk)	Flour (sifted soft wheat) [1]	Fat [2]	Eggs	Baking powder	Sugar	Salt	Flavoring
Pop-overs	1 cup	1 cup	1 to 2 teaspoons.	1 to 1½			⅓ teaspoon	
Waffles	do	1⅓ cups	2 tablespoons.	1 to 2	2 teaspoons	1 tablespoon.	½ teaspoon	
Griddle cakes	do	1½ cups	1 to 2 tablespoons.	1	do	0 to 1 tablespoon	do	
Fritter batter:								
No. 1, cover	do	1¼ cups	1 teaspoon.	1	1 teaspoon		⅓ teaspoon	
No. 2, binding	do	1¾ cups	1 tablespoon.	1	2 teaspoons		½ teaspoon	
Muffins	do	2 cups	2 to 4 tablespoons.	1	do	1 to 2 tablespoons	do	
Cottage pudding	do	2⅓ cups	¼ to ⅓ cup	1	3 teaspoons	⅔ cup	¼ teaspoon	½ teaspoon P. c.
Foundation cake	do	3 cups	½ cup	2 to 3	4 teaspoons	1½ cups	do	
Baking-powder biscuit.	do	do	4 to 6 tablespoons.		do		1 teaspoon	
Pastry	About 2½ tablespoons water	1½ cups	5½ to 7 tablespoons				do	

[1] Directions for substituting hard wheat flour are given on p. 9.

[2] These quantities are for fat containing no water. When butter or other fats containing water are used about one-sixth more should be allowed (p. 10).

FLOUR

How to substitute various types of wheat flours in quick breads, cakes, cookies, and pastry.—The quantities of flour recommended in Table 2 are for the soft wheat, or pastry, type. Hard-wheat flour may be substituted on the basis of seventh-eighths cup for each cup of soft-wheat flour, for these quantities weigh practically the same, since the hard-wheat flour is more compact. On the same basis of weight three-fourths cup of coarse graham or seven-eighths cup of more finely ground graham flour, measured before sifting, may be used in place of 1 cup of sifted pastry flour.

LIQUID

Milk is the most desirable liquid to use in quick breads, cake, and cookies, because of flavor, texture, and food value. Whole milk, skimmed milk, or powdered or evaporated milk diluted to the proper consistency, gives practically the same results, except for variations in food value. In any product except pop-overs sour milk may be substituted for sweet, cup for cup, according to the general rules for leavening agents. In some cases a mixture of milk and water, or even water alone, may be used with no great loss in flavor or texture. In pastry, water is preferable. When cream is used as the liquid, it is not necessary to use so much other shortening.

LEAVENING AGENTS

With a few exceptions such as pop-overs, which are raised by water vapor, and sponge cakes, which are raised by water vapor and air, quick breads and cakes require baking powder or other chemical leavening agent.

Air may be beaten directly into the batter, but generally is added by means of beaten eggs. Though the air alone does not expand enough to leaven a mixture, it helps to make it light before baking, and its expansion supplements the effect of the water vapor and the chemical agent.

Water vapor is formed in a batter or dough during baking as the liquid in it becomes heated. The vapor thus formed raises the mixture just as it does the cover of a saucepan when there is enough pressure.

Baking powders.—Baking powders usually contain sodium bicarbonate and some acid-reacting material, such as cream of tartar, sodium aluminum sulfate, or a phosphate, mixed in the proper proportions, with starch to keep the chemicals dry. If baking powder becomes moist before it is used the soda and the acid start reacting, gas is liberated, and the powder loses some of its leavening power. This is why baking powders should be kept tightly covered and in a dry place.

The commercial powders are classified according to the kind of acid-reacting material used, as tartrate, phosphate, or so-called alum powders. Some of these materials react more quickly than others, and commercial powders in some cases contain two of them, so that not all of the gas will be released at one time. None of the powders on the market are known to be harmful when used in the quantities needed for leavening.

In general, for each cup of flour in a batter or dough 1 to 1½ teaspoons of baking powder are needed. In butter cakes containing a large proportion of egg white this amount may be decreased. In pop-overs and true sponge cakes no baking powder is used.

Self-rising flours.—The products known as self-rising flours are composed of flour, salt, soda, and an acid-reacting material such as is used in commercial baking powders. Modern machinery makes it possible to weigh out these materials accurately and mix them more thoroughly than in the home. Directions sent with these flours should be used in the preparation of products from them, and no other leavening agent should be added.

Soda and sour milk or molasses.—Baking soda used with sour milk or molasses acts in practically the same way as baking powder in leavening a mixture. The soda should be mixed with the flour and other dry ingredients so that it will not begin to act until it is in the batter or dough. The old custom of putting the soda into the sour milk or molasses is not good practice, because as soon as they are mixed gas begins to escape.

If corn sirup or honey is used in place of molasses, the soda should be omitted, because these are only faintly acid, and baking powder or other leavening agent should be depended on for raising the mixture.

A scant half teaspoon of soda is about the right amount to use for each cup of sour milk or an even half teaspoon for a cup of molasses. It is better to use too little soda than too much, for an excess gives a disagreeable flavor and odor as well as the typical yellow color. *One scant teaspoon of soda, if there is plenty of acid to react with it, may be considered equivalent in leavening effect to four teaspoons of baking powder,* because baking powder is about one-fourth soda.

Substituting sour milk and soda for sweet milk and baking powder, or vice versa.—When proportions are given in terms of sweet milk and baking powder, an equal quantity of sour milk may be substituted and enough soda used approximately to neutralize the acid, or a scant half teaspoon for each cup of sour milk. In the case of thin batters the soda and sour milk generally furnish enough leavening, but for thick batters or doughs baking powder is usually needed in addition. For instance, in the proportions for griddle cakes (p. 11) 1 cup of sweet milk and 2 teaspoons of baking powder may be replaced by 1 cup of sour milk and a scant half teaspoon of soda. This quantity of soda is not only right for the sour milk, but with the milk is approximately equivalent in leavening power to the 2 teaspoons of baking powder. For biscuits, which call for 1 cup of milk and 4 teaspoons of baking powder, if 1 cup of sour milk and a scant half teaspoon of soda were substituted, 2 teaspoons of baking powder would be needed also to be equivalent to the above quantity of baking powder.

When sweet milk is to be used in place of sour, baking powder is substituted for all of the soda in the proportion of 4 teaspoons of baking powder for 1 teaspoon of soda if no other acid ingredient such as molasses is used. If such an acid ingredient is used, as in gingerbread, some soda is required.

SHORTENING

Fat helps to make baked products tender and in some cases affects the flavor. Almost any mild-flavored, edible fat is satisfactory for most baking purposes. In general, above 7 parts of butter or margarine are required to give the same amount of fat as 6 of lard or similar fats containing no water. In substituting butter or margarine for the fat called for in Table 2 about 3 extra tablespoons for each cup of fat should be used.

BAKING TEMPERATURES

The heat during baking brings about five important changes in batters and doughs. It hastens the action of baking powder or other chemical leavening agent in forming gas. It causes some of the liquid in the mixture to change to water vapor, which aids in leavening. It hardens the proteins, particularly the gluten in flour and the albumen of egg, cooks the starch, and browns the crust.

The chief knack in baking, then, is to regulate the temperature so that the bread or cake will set as soon as enough gas and water vapor have formed but before they have time to escape or condense.

The correct temperature for baking depends on the kind of leavening, on the proportions of ingredients, and on the size and shape of the product. So far as possible these points are considered, in giving temperatures for each type of baked stuff. Large compact masses take longer to heat through than small, flat ones, and should therefore be baked more slowly. A large loaf cake, for example, needs lower temperature and longer baking than a layer cake.

For most products, if the temperature is right at the start it need not be changed during baking. A reliable oven thermometer or an automatic temperature regulator that has been tested is the surest means of knowing when the temperature is right. A suitable thermometer may be bought at relatively low cost and used in any type of oven.

Especially in baking cakes the oven door should be opened only when necessary and the pan should be moved as little as possible while the mixture is setting.

If baked at the right temperature, cakes and quick loaf breads may generally be considered done when they shrink from the pan, but for safety they may be tested with a clean straw or toothpick.

When the pans containing cakes in loaves or layers are taken from the oven they should be turned upside down until the cake cools partially and becomes firmer. Cake is too soft and hot for handling when it first comes from the oven. It should be removed from the pan, however, before it reaches room temperature or has a chance to sweat.

POP-OVERS, GRIDDLE CAKES, MUFFINS, AND THE LIKE

The so-called batter method of mixing is generally recommended for pour batters and for muffin and other plain drop batters, because it is quick and easy. The dry ingredients are mixed and sifted, the eggs are beaten slightly and added to the other liquid ingredients, which are then stirred gradually into the dry. The melted fat is added last to the batter rather than mixed with the liquids.

POP-OVERS (8 TO 12 POP-OVERS)

1 cup milk.
1 cup sifted soft-wheat flour.
1 to 2 teaspoons fat.
1 to 1½ eggs.
⅛ teaspoon salt.

Stir the liquid slowly into the dry ingredients to avoid forming lumps.

Fill hot, well-greased muffin pans, preferably iron or granite because they hold the heat, not more than half full of batter and place at once in a hot oven (about 425° F.). After about 20 minutes lower the temperature to about 350° F., so that the inside of the pop-overs will dry out a little without making the crusts too hard and brown. Pop-overs require baking about 45 minues.

WAFFLES

1 cup milk.
1⅛ cups sifted soft-wheat flour.
2 tablespoons fat.
1 to 2 eggs.
2 teaspoons baking powder.
1 tablespoon sugar.
½ teaspoon salt.

In mixing, fold the beaten white of egg into the batter after all the other ingredients have been added. Have the waffle iron hot enough to brown the waffle quickly, and well greased unless it is the electrically heated aluminum kind. In that case add an extra tablespoon of melted shortening to the batter.

GRIDDLE CAKES (16 TO 24 CAKES)

1 cup milk.
1½ cups sifted soft-wheat flour.
1 to 2 tablespoons fat.
1 egg.
2 teaspoons baking powder.
0 to 1 tablespoon sugar.
½ teaspoon salt.

Mix the batter in the usual way (p. 10) and bake the cakes on a lightly greased hot griddle.

FRITTERS NO. 1

1 cup milk.
1¼ cups sifted soft-wheat flour.
1 egg.
1 teaspoon fat.
1 teaspoon baking powder.
⅓ teaspoon salt.

Combine the liquid and the dry ingredients according to the method on page 10. Dip large pieces of fruits or vegetables, such as pineapple or tomatoes, into this cover batter and fry in deep fat at about 375° F.

FRITTERS NO. 2

1 cup milk.
1¾ cups sifted soft-wheat flour.
1 tablespoon fat.
1 egg.
2 teaspoons baking powder.
½ teaspoon salt.

Mix the ingredients according to the method on page 10. This binding batter for fritters is generally used with small pieces of fruits or vegetables, such as corn cut from the cob, that would not be held together by the thinner cover batter described under "Fritters No. 1." When the vegetable or fruit has liquid with it, as in canned corn, this may take the place of part of the liquid in the batter. Fry these fritters in deep fat at about 365° F., because they need time to cook through to the center, whereas the other type usually needs to be cooked only on the outside.

MUFFINS (10 TO 12 MUFFINS)

1 cup milk.
2 cups sifted soft-wheat flour.
2 to 4 tablespoons fat.
1 egg.
2 teaspoons baking powder.
1 to 2 tablespoons sugar.
½ teaspoon salt.

Mix according to the method on page 10 and bake in greased tins in a hot oven (400° to 425° F.).

QUICK LOAF BREADS

Fruit, nut, and other quick loaf breads are made from a mixture like that for muffins only slightly thicker in some cases. If the batter is comparatively thin, the fruit or nuts should be floured before being added. The temperature of the oven should be low enough for the bread to bake through without making the crust too hard or brown. For a small loaf a temperature of 375° F. is about right; for a large loaf it should be lower. Before taking the bread from the oven it should be tested with a straw or a toothpick to make sure that the inside is cooked. Sometimes the leavening does not work quickly enough if the mixture is rather thick. In that case it should be allowed to stand for 20 to 30 minutes in the baking pan before it is put into the oven.

GINGERBREAD (2 THIN LOAVES)

1 cup milk.
3⅛ cups sifted soft-wheat flour.
⅓ cup fat.
1 egg.
½ teaspoon soda.
4 teaspoons baking powder.
½ cup sugar.
1 cup molasses.
½ teaspoon salt.
1 teaspoon ginger.
½ teaspoon cloves.
½ teaspoon cinnamon.

Stir the liquid into the dry ingredients (p. 10). Since gingerbread is richer than muffins, it is more likely to fall in the oven if not properly baked. For a shallow loaf the oven should be moderate (about 375° F.); if muffin pans are used, it should be fairly hot, or about 400° F.

Sour milk may be used instead of sweet in the same quantity, but in that case the soda should be increased to a scant teaspoon and the baking powder decreased to 2 teaspoons.

BISCUITS AND PASTRY

All dry materials are mixed and sifted together, the fat is worked in,

and the liquid is added to this fat-and-flour mixture. For rich pastry all the materials should be mixed cold so that the fat will not become soft. For a mixture containing only 5½ tablespoons of fat in 1½ cups of flour especially if hard fat is used, it is better to have the materials at room temperature (about 70° F.). Cutting the fat into the flour with knives, a pastry fork, or a biscuit cutter is often recommended to avoid warming or handling it too much, but the tips of the fingers may be used if the work is done quickly. When oil instead of solid fat is used, it is generally better to combine the oil with the liquid. The dough should be worked as little and lightly as possible so that the gluten will not be developed too much and the product made tough.

BISCUITS (24 TO 30 BISCUITS)

1 cup milk.
3 cups sifted soft-wheat flour.
4 to 6 tablespoons fat.
4 teaspoons baking powder.
1 teaspoon salt.

Either milk or water may be used as the liquid in baking-powder biscuits, and the quantity varied to obtain the kind of biscuit desired. Some persons prefer the texture of a biscuit made from very stiff dough, using as little liquid as possible. Others like a lighter biscuit, for which the dough is made very soft by using more liquid and combining very lightly. Drop biscuits which are not rolled out may be made by adding still more liquid than for a soft dough.

Mix the ingredients according to the method given above and bake the biscuits in a shallow pan or on a baking sheet. The pan should be lightly greased for drop biscuits, but this is not necessary for the other types. Biscuits require a very hot oven (450° to 500° F.).

Sour milk may be substituted for the sweet called for in these proportions according to the rules given on page 9.

MEAT-PIE CRUST

Crust for meat pie is made in the same way as biscuit dough by using a little more fat. Fat from the meat may be used for shortening. The dough is rolled or patted out about one-half inch thick to the proper size for the baking dish, placed on top of the filling, and baked at about 425° F., that is, at slightly lower temperature than for biscuits. The crust bakes better if the filling is hot at the start.

SHORTCAKE

Shortcake dough is also similar to that for biscuits except that it contains fat in the proportion of one-third to one-half cup to three cups of flour and sometimes a little sugar. Shortcake is usually baked in two layers, one on top of the other wiped with butter between, so that it will split easily. The oven should be rather hot (425° F. for a large sheet or 450° for individual shortcakes).

PLAIN PIE CRUST (1 TWO-CRUST PIE)

About 2½ tablespoons water.
1½ cups sifted soft-wheat flour.
5½ to 7 tablespoons fat.
1 teaspoon salt.

Combine fat and flour according to directions given. Add the water slowly and use no more than is absolutely necessary. Roll the dough very lightly. If the lower crust is baked separately, the oven should be about 450° F. However, a pie with a filling that needs to be cooked can not be left long in an oven as hot as this, because the crust bakes too fast for the filling. The temperature should be high (about 450° F.) to start and then lowered rapidly after 8 or 10 minutes so that the filling may cook through without overcooking the crust.

CAKES, DOUGHNUTS, AND COOKIES

Cakes are mixed by different methods depending on whether they contain a large proportion of fat, as in the so-called butter cakes, or whether, like sponge cakes, they contain no fat and are leavened by means of beaten eggs. The methods of mixing are therefore given with the other directions for making cakes of these types. The less rich mixtures, such as cottage pudding, can be successfully combined in the same way as muffins (p. 10).

COTTAGE PUDDING (1 LARGE THIN LOAF)

1 cup milk.
2⅓ cups sifted soft-wheat flour.
¼ to ⅛ cup fat.
1 egg.
3 teaspoons baking powder.
⅔ cup sugar.
¼ teaspoon salt.
½ teaspoon flavoring.

Mix the ingredients in the same way as for muffins (p. 10). Bake in a fairly hot oven (about 390° F.) if muffin pans are used; or at a more moderate temperature (about 365° F.) if in a thin loaf. Cottage pudding is usually served hot with a sauce.

BUTTER CAKES

Butter cake is the term often given to this group containing butter or other fat to distinguish them from the sponge cakes, which contain no shortening.

The proportions for plain, foundation, and rich butter cakes are given

TABLE 3.—*Proportions for three types of butter cakes*

Ingredients	Plain cake	Foundation cake	Rich cake
Milk	1⅓ cups	1 cup	1 cup.
Flour (soft wheat)	3 cups	3 cups	3 cups.
Fat[1]	⅓ cup	½ cup	1 cup.
Eggs	1	2 to 3	4.
Baking powder	5 teaspoons	4 teaspoons	4 teaspoons.
Sugar	1¼ cups	1½ cups	2 cups.
Salt	¼ teaspoon	¼ teaspoon	¼ teaspoon.
Flavoring	½ teaspoon	½ teaspoon	½ teaspoon.

[1] These proportions are for fat containing no water. If butter or other fat containing water is used, about 3 tablespoons more for each cup of fat should be allowed.

in Table 3. The foundation cake is rich enough for most purposes; especially if baked in layers and put together with filling. These quantities will make two thick or three thin layers.

Though the ingredients of these cakes may be combined by the method used for muffins with fairly good results, with slightly more effort better texture may be produced in the following way: Place the fat in a warm place until it becomes soft, though not melted, so that it may be combined easily with the sugar. This is just as satisfactory and much quicker than the laborious method of creaming together the cold fat and sugar. After the fat and sugar have been thoroughly combined stir in the beaten egg yolks and add alternately the dry ingredients, which have been mixed and sifted together, and the liquid. At the start add only a small quantity of liquid. If too much is added, it dissolves the sugar, and the fat separates into large masses that must be recombined with the other ingredients by beating, thus making useless the work of combining the fat and sugar in the beginning. Add the flavoring and fold in the well-beaten egg whites. Pour the batter into lightly greased, floured pans, taking care that it is spread evenly. If baked in a thick loaf, the oven temperature should be very moderate (about 325° F.); but if baked as cup cakes or thin layers the oven should be about 375° F.

Substitutions.—Recipes calling for a relatively large number of eggs may sometimes be made more cheaply by using fewer eggs, though a less desirable product results. More milk or water should be added to take the place of the liquid of the eggs and more baking powder for leavening. In general, for each egg left out about 2 tablespoons of liquid and one-half teaspoon of baking powder should be added, as shown in the proportions for plain and foundation cake. This substitution is more successful usually in cakes which have a relatively low proportion of fat.

Chocolate may take the place of some fat and flour. One ounce of chocolate may be considered the equivalent of about 1 tablespoon of fat and 1 tablespoon of flour, and should be melted and added to the batter just before the egg whites are folded in.

Whites or yolks of eggs may be used instead of whole eggs in making fancy white or yellow cakes, or as an economy in using up parts of eggs left over. For most purposes 2 whites or 2 yolks may be considered roughly the equivalent of 1 egg. When yolks alone are used, a little extra baking powder is sometimes needed, since air can not be combined so readily as in the case of the egg whites.

SPONGE CAKES

The cakes made without fat are called sponge cake, sunshine cake, and angel food, depending on whether the same number of egg yolks and whites, a large proportion of whites, or only whites are used. Eggs supply the liquid in these cakes and serve as a means of adding air for leavening. Lemon juice or cream of tartar is added, because the acid affects the egg in such a way as to make the cake more tender. Fine, soft-wheat flour gives best results in cakes of this type. The quantities given will make two medium-sized loaves each.

Because of their delicate texture sponge cakes require more careful mixing and baking than other types. The usual method of mixing plain sponge cakes is as follows: Add the sugar to the beaten egg yolks and then the flour and half the salt after the flour has been sifted. Add the other half of the salt to the egg whites, beat them stiff, fold them into the mixture, and add the flavoring last. For beating the eggs a dover beater gives satisfactory results and requires less time and energy than a wire

TABLE 4.—*Proportions for sponge cakes*

Ingredients	Sponge cake	Sunshine cake	Angel food
Flour (soft wheat)	1 cup	1 cup	1 cup.
Eggs	1 cup (4 or 5 eggs)	1 cup (6 whites and 3 yolks).	1 cup whites (8 fairly large).
Sugar	1 cup	1 to 1¼ cups	1 to 1½ cups.
Salt	½ teaspoon	½ teaspoon	½ teaspoon.
Flavoring and acid	3 teaspoons lemon juice.	1 teaspoon flavoring	1 teaspoon flavoring.
	½ lemon rind grated	1 teaspoon cream of tartar.	1 teaspoon cream of tartar.

whisk. Pour the batter, as soon as it is mixed, into smooth, ungreased baking pans. For a large or medium-sized loaf a tube pan is best, because the center opening allows the mixture to heat evenly. Powdered sugar may be sifted over the top to make the crust more crisp. The oven should be ready for the cake as soon as it is mixed and in the pan. A large or medium-sized sponge cake should be baked slowly at about 325° F., small cakes at somewhat higher temperature, or about 340° F.

Sunshine cake is mixed and baked in the same way as plain sponge cake, except that some of the beaten whites are mixed with the yolks and sugar to help moisten them before all of the flour is added.

Angel food is mixed in a slightly different way than plain sponge cake. The sugar, flour, and half the salt are sifted together several times. The egg whites are beaten with the other half of the salt until they are frothy; then the cream of tartar is added and they are beaten until stiff. The dry ingredients are then folded carefully into the beaten egg whites, and when the mixture is partly blended the flavoring is added. Only the folding motion should be used in mixing, for stirring tends to release the air depended on for leavening. A smooth tube pan is best for baking angel food, and a fairly large cake will require about an hour in an oven at a temperature of 325° F. It may be tested in the same way as any other cake.

Substitutions.—The proportions for sponge cake and angel food given in Table 4 may be modified by substituting milk or water and baking powder for one or two of the eggs according to the general rule of two tablespoons of liquid and one-half teaspoon of baking powder for each egg omitted. In this case the leavening is sifted with the flour and the liquid is added before the egg whites are folded into the batter. Cakes of this kind may be baked at a temperature slightly higher (about 340° F. for a loaf) than is used for true sponge cakes.

DOUGHNUTS (40 DOUGHNUTS)

1 cup milk.
4½ cups sifted soft-wheat flour.
2 teaspoons fat.
2 eggs.
5 teaspoons baking powder.
1 cup sugar.
2 teaspoons salt.
½ teaspoon cinnamon.
⅛ teaspoon nutmeg.

Mix the ingredients according to the method for butter cakes (p. 12), roll out the dough about one-third inch thick without handling it any more than necessary, cut out the doughnuts, and fry in deep fat hot enough (about 375° F.) to make a doughnut rise to the surface quickly and to brown each side in about one minute.

DROP COOKIES (50 COOKIES)

¾ cup milk.
4 cups sifted soft-wheat flour.
¾ cup fat.
2 eggs.
4 teaspoons baking powder.
1½ cups sugar.
½ teaspoon salt.
3 teaspoons flavoring.

Mix the ingredients according to the method given for butter cake (p. 12). Drop small portions of the mixture on a greased baking sheet and bake in a moderately hot oven (about 375° F.).

CRISP COOKIES (100 THIN COOKIES)

¼ cup milk or less.
4 cups sifted soft-wheat flour.
1 cup fat.
2 eggs.
4 teaspoons baking powder.
2 cups sugar.
½ teaspoon salt.
3 teaspoons flavoring.

Combine the ingredients in the same way as for butter cakes (p. 12), roll the dough thin, handling it no more than necessary, cut it in any desired shapes, and bake the cookies on a greased baking sheet in a fairly hot oven (about 375° to 400° F.). Instead of rolling out the dough it may be chilled and sliced thinly. Whether rolled or sliced, chilling the dough makes it easier to handle.

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